

IN THE CLAIMS

Please amend claims 1, 10 and 11, cancel claims 2-4, and add new claims 12-16, as follows:

1. (CURRENTLY AMENDED) A method for forming a nitride semiconductor device, comprising:

- (a) growing one or more gallium nitride (GaN) layers on a substrate; and
- (b) growing one or more non-polar a-plane (Al,B,In,Ga)N layers ~~on~~ off of a grown surface of the GaN layers to form at least one non-polar a-plane quantum well ranging in width from approximately ~~20 Å~~ to approximately ~~70 Å~~.

2. (CANCELED)

3. (CANCELED)

4. (CANCELED)

5. (ORIGINAL) The method of claim 1, wherein the GaN layers are non-polar a-plane GaN layers and the substrate is an r-plane substrate.

6. (ORIGINAL) The method of claim 1, wherein the substrate is a sapphire substrate.

7. (ORIGINAL) The method of claim 1, wherein the growing step (a) comprises:

- (1) annealing the substrate;
- (2) depositing a nitride-based nucleation layer on the substrate;
- (3) growing the GaN layer on the nucleation layer; and
- (4) cooling the GaN under a nitrogen overpressure.

8. (ORIGINAL) The method of claim 1, wherein the growing steps are performed by a method selected from a group comprising metalorganic chemical vapor deposition (MOCVD),

molecular beam epitaxy (MBE), liquid phase epitaxy (LPE), hydride vapor phase epitaxy (HVPE), sublimation, and plasma-enhanced chemical vapor deposition (PECVD).

9. (ORIGINAL) A device manufactured using the method of claim 1.

10. (CURRENTLY AMENDED) A nitride semiconductor device comprising one or more gallium nitride (GaN) layers grown on a substrate, and one or more non-polar a-plane quantum wells formed from one or more non-polar a-plane (Al,B,In,Ga)N layers grown off of a grown surface of the GaN layers, wherein the nitride semiconductor device is created using a process comprising:

(a) growing one or more gallium nitride (GaN) layers on a substrate; and

(b) growing one or more non-polar a-plane (Al,B,In,Ga)N layers on the off of a grown surface of the GaN layers to form at least one non-polar a-plane quantum well ranging in width from approximately 20 Å to approximately 70 Å.

11. (CURRENTLY AMENDED) A nitride semiconductor device, comprising:

(a) one or more gallium nitride (GaN) layers grown on a substrate; and

(b) one or more non-polar a-plane quantum wells formed from one or more non-polar a-plane (Al,B,In,Ga)N layers grown on off of a grown surface of the GaN layers, wherein the quantum well has a width ranging from approximately 20 Å to approximately 70 Å.

12. (NEW) The method of claim 1, wherein the quantum well ranges in width from approximately 20 Å to approximately 70 Å.

13. (NEW) The method of claim 1, wherein the quantum well has a doped barrier.

14. (NEW) The method of claim 13, wherein the doped barrier is doped with silicon.

15. (NEW) The method of claim 14, wherein the doped barrier is doped with silicon with a dopant concentration of  $2 \times 10^{18} \text{ cm}^{-3}$ .

16. (NEW) The method of claim 1, wherein the quantum well is an GaN/AlGaN quantum well.